



## DEPARTMENT OF TRANSPORTATION

### National Highway Traffic Safety Administration

Docket No. NHTSA-2014-0068

Toyota Motor North America, Inc.

#### Receipt of Petition for Temporary Exemption from an Electrical Safety Requirement of FMVSS No. 305

**AGENCY:** National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

**ACTION:** Notice of receipt of a petition for a temporary exemption from a provision of Federal Motor Vehicle Safety Standard (FMVSS) No. 305, Electric-powered vehicles: electrolyte spillage and electrical shock protection.

**SUMMARY:** In accordance with the procedures in 49 CFR part 555, Toyota Motor North America, Inc. (Toyota) has petitioned the agency for a temporary exemption from one requirement of FMVSS No. 305. That portion of FMVSS No. 305 requires manufacturers to maintain a certain level of electrical isolation (or reduce the voltage below specified levels) of high voltage electrical components of an electric vehicle (EV) in the event of a crash in order to protect the vehicle's occupants and first responders. Toyota states that a forthcoming fuel cell vehicle (FCV) model cannot meet this requirement due to certain design characteristics of their FCVs. Instead, Toyota states that it is using alternative strategies to help ensure that occupants and first responders are protected in the event of a crash. NHTSA has made no judgment on the merits of the application. This notice of receipt of an application for a temporary exemption is published in accordance with statutory and administrative provisions.

**DATES:** You should submit your comments not later than **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

**FOR FURTHER INFORMATION CONTACT:** Jesse Chang, Office of the Chief Counsel, NCC-112, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE, Washington, DC 20590. Telephone: (202) 366-2992; Fax: (202) 366-3820.

**ADDRESSES:** We invite you to submit comments on the application described above. You may submit comments identified by docket number in the heading of this notice by any of the following methods:

- Fax: 1-202-493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, Room W12-140, 1200 New Jersey Avenue, SE, Washington, DC 20590.
- Hand Delivery: 1200 New Jersey Avenue, SE, West Building Ground Floor, Room W12-140, Washington, DC, between 9 am and 5 pm, Monday through Friday, except Federal Holidays.
- Federal eRulemaking Portal: Go to <http://www.regulations.gov>. Follow the online instructions for submitting comments.

Instructions: All submissions must include the agency name and docket number. Note that all comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided. Please see the Privacy Act discussion below. We will consider all comments received before the close of business on the comment closing date indicated above. To the extent possible, we will also consider comments filed after the closing date.

Docket: For access to the docket to read background documents or comments received, go to <http://www.regulations.gov> at any time or to 1200 New Jersey Avenue, SE, West Building Ground Floor, Room W12-140, Washington, DC 20590, between 9 am and 5 pm, Monday through Friday, except Federal Holidays. Telephone: (202) 366-9826.

Privacy Act: Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (65 FR 19476) or you may visit <http://www.dot.gov/privacy.html>.

Confidential Business Information: If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given under FOR FURTHER INFORMATION CONTACT. In addition, you should submit two copies, from which you have deleted the claimed confidential business information, to Docket Management at the address given above. When you send a comment containing information claimed to be confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation (49 CFR part 512).

## **SUPPLEMENTARY INFORMATION:**

### **I. The Electrical Safety Requirement in FMVSS No. 305 and its Purpose**

In 2000, the agency created Federal Motor Vehicle Safety Standard (FMVSS) No. 305 to help facilitate the safe introduction of EVs into the marketplace.<sup>1</sup> While FMVSS No. 305 addresses a number of safety concerns relevant to EVs (e.g., battery retention

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<sup>1</sup> See 65 FR 57980 (September 27, 2000).

and electrolyte spillage), paragraph S5.3 of the standard, at issue here, requires EVs to maintain electrical isolation of various major electrical components (e.g., components related to the vehicle's propulsion) after specified crash tests. The purpose of the requirements in S5.3 is to reduce the risk of high voltage electrical shock to the vehicle's occupants and the first responders in the event of a crash.<sup>2</sup>

NHTSA published its most recent major update to the S5.3 requirements in 2010.<sup>3</sup> In this update, NHTSA expanded the types of electrical components that would be covered by the requirement and the options available for complying with the requirement. Namely, the agency expanded the coverage of the standard to include other high voltage components of the EV beyond the propulsion battery. Further, the updated requirements recognize the different safety implications between Alternating Current (AC) and Direct Current (DC) by establishing different requirements for each type of electrical component. FMVSS No. 305 further specifies various crash test conditions under which a vehicle is required to meet the aforementioned requirements. Depending on the particular crash scenario (e.g., frontal barrier, rear moving barrier, and side moving deformable barrier), the tests can be conducted at any speed up to a maximum speed of 48, 80, or 54 km/h, respectively.<sup>4</sup>

The subject of Toyota's petition is these electrical safety requirements in paragraph S5.3 of FMVSS No. 305. Toyota states in its petition that certain design aspects of their Fuel Cell Vehicles (FCVs) preclude the vehicle from meeting the electrical safety requirements in paragraph S5.3 of FMVSS No. 305. However, Toyota

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<sup>2</sup> *See id.*

<sup>3</sup> *See* 75 FR 33515 (June 14, 2010). NHTSA also answered petitions for reconsideration on this final rule on July 29, 2011 dealing with clarifying the definitions and test procedures of the June 14, 2010 final rule. *See* 76 FR 45436.

<sup>4</sup> The speed condition for each test is specified in paragraphs S6.1 to S6.3.

states that it will implement various alternative strategies to ensure that the vehicle occupants and first responders are protected from an undue risk of high voltage electrical shock after a crash. Section III below describes Toyota's petition in more detail.

## **II. Statutory Authority for Temporary Exemptions**

The National Traffic and Motor Vehicle Safety Act (Safety Act), codified at 49 U.S.C. Chapter 301, provides the Secretary of Transportation authority to exempt, on a temporary basis and under specified circumstances, motor vehicles from a motor vehicle safety standard or bumper standard. This authority is set forth at 49 U.S.C. § 30113. The Secretary has delegated the authority for implementing this section to NHTSA.

The Act authorizes the Secretary to grant a temporary exemption to a vehicle manufacturer under certain conditions. The relevant conditions for this petition require the Secretary to find:

- (1) that "the exemption would make the development or field evaluation of a low-emission motor vehicle easier and would not unreasonably lower the safety level of that vehicle;" or
- (2) that "compliance with the standard would prevent the manufacturer from selling a motor vehicle with an overall safety level at least equal to the overall safety level of nonexempt vehicles."<sup>5</sup>

NHTSA established 49 CFR part 555, Temporary Exemption from Motor Vehicle Safety and Bumper Standards, to implement the statutory provisions concerning temporary exemptions. The requirements specified in 49 CFR 555.5 state that the petitioner must set forth the basis of the application by providing the required information

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<sup>5</sup> See 49 U.S.C. § 30113.

under part 555.6, and the reasons why the exemption would be in the public interest and consistent with the objectives of 49 U.S.C. Chapter 301.

A petition under the basis that the exemption would make easier the development or field evaluation of a low-emission motor vehicle must include the information specified in 49 CFR 555.6(c). The main requirements of that section include: (1) substantiation that the vehicle is a low-emission vehicle; (2) documentation establishing that a temporary exemption would not unreasonably degrade the safety of a vehicle; (3) substantiation that a temporary exemption would facilitate the development or field evaluation of the vehicle; and (4) a statement of whether the petitioner intends to conform to the standard at the end of the exemption period.

A petition under the basis that compliance with the standard would prevent the manufacturer from selling a motor vehicle with an overall safety level at least equal to the overall safety level of nonexempt vehicles must include the information specified in 49 CFR 555.6(d). The main requirements of that section include: (1) a detailed description of how the motor vehicle differs from one that conforms with the standard; (2) a detailed description of any safety features that are offered as standard equipment that are not required by an FMVSS; (3) the results of any tests showing that the vehicle doesn't meet the standard but has an overall level of safety at least equal to nonexempt vehicles; and (4) a statement of whether the petitioner intends to conform to the standard at the end of the exemption period.

### **III. Overview of Petition**

In accordance with 49 U.S.C. § 30113 and the procedures in 49 CFR part 555, Toyota Motor North America, Inc. (Toyota) submitted a petition asking the agency for a

temporary exemption from the electrical safety requirements in paragraph S5.3 of FMVSS No. 305. They state that they plan to manufacture an FCV model and that certain aspects of their FCV design prevent it from meeting the requirements in S5.3 of FMVSS No. 305.

As described above, the requirements of paragraph S5.3 state that (after certain specified crash tests) a vehicle must maintain an electrical isolation of 500 ohms/volt for AC high voltage sources (and DC high voltage sources without electrical isolation monitoring) or 100 ohms/volt for DC high voltage sources with electrical isolation monitoring. Vehicles subject to FMVSS No. 305 must meet these requirements when tested under any speed up to a maximum speed of 48, 54, or 80 km/h (depending on the particular crash test).

Toyota states in its petition that its vehicle will be able to meet the requirements of paragraph S5.3 of FMVSS No. 305 under some, but not all, of the specified test speeds. The company states that under higher speeds (e.g., speeds similar to when an air bag would deploy), an automatic disconnect mechanism activates to ensure that the high voltage components will meet the requirements of paragraph S5.3. However, Toyota states that the automatic disconnect mechanism in its FCVs will not be triggered in impacts at relatively low speeds. Toyota believes it would not be appropriate to equip FCVs with sensors that would trigger the automatic disconnect mechanism following minor impacts (such as parking lot collisions or curb contacts), since it is not possible to drive the vehicle after the system is disconnected. Toyota states that its FCV would be

unable to meet the requirements of paragraph S5.3 in such low speed crash conditions where the automatic disconnect mechanism is not triggered.<sup>6</sup>

Toyota applies for this exemption under two alternative bases.<sup>7</sup> First, Toyota states that this exemption would make the development or field evaluation of a low-emission motor vehicle easier and would not unreasonably lower the safety level of the vehicle. Second, Toyota believes that compliance with FMVSS No. 305 would prevent it from selling a motor vehicle with an overall safety level at least equal to the overall safety level of non-exempt vehicles. Toyota requests the exemption (under either basis) for 2 years and has stated that it would not produce more than 2,500 exempted FCVs within any 12-month period during the exemption.

In support of its first basis (low-emission vehicle) Toyota states that its FCV qualifies as a low-emission vehicle because its FCV will not emit particulate matter. Further, Toyota states that the FCV's noncompliance with paragraph S5.3 of FMVSS No. 305 would not unreasonably degrade the safety of the vehicle because the vehicle has additional safety features designed to protect vehicle occupants and first responders in the event of a crash. First, Toyota equipped the FCV high voltage sources with physical barriers that they believe would prevent any direct physical contact with live voltage sources after the crash. Second, Toyota ensured that all physical barriers would be grounded to the chassis with a grounding resistance of less than 0.1 ohms. The company states that this would protect against any indirect contact with high voltage sources. Finally, Toyota states that the high voltage sources would continue to maintain an

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<sup>6</sup> Additional information is available in Toyota's petition. The petition is available in the docket referenced at the beginning of this document.

<sup>7</sup> To view the application, go to <http://www.regulations.gov> and enter the docket number set forth in the heading of this document.



electrical isolation of 100 ohms/volt. Through the combination of these three attributes, Toyota believes that the noncompliance with paragraph S5.3 would not unreasonably degrade the safety of its FCV.

In support of the second basis (overall safety is at least equal to a nonexempt vehicle), Toyota states that its FCV would not meet the current requirements of FMVSS No. 305 in low speed crashes where the automatic disconnect does not activate and Toyota would not be able to sell the vehicle in the United States. However, due to the additional safety features that the company plans to incorporate into its FCVs (i.e., physical barrier + grounding of the physical barriers to the chassis + maintaining electrical isolation of 100 ohms/volt), Toyota believes that their FCV maintains a level of safety that is at least equivalent to a vehicle complying with FMVSS No. 305. In support of this contention, Toyota cites their belief that their FCV would comply with the relevant European standard (ECE R.100) and Global Technical Regulation (GTR) No. 13 which allow manufacturers to ensure electrical safety through methods such as encasing high voltage sources in a physical barrier.

#### **IV. Completeness and Comment Period**

Upon receiving a petition, NHTSA conducts an initial review of the petition with respect to whether the petition is complete and whether the petitioner appears to be eligible to apply for the requested exemption. The agency has tentatively concluded that the petition from Toyota is complete and that Toyota is eligible to apply for a temporary exemption. The agency has not made any judgment on the merits of the application, and is placing a non-confidential copy of the petition in the docket.

The agency seeks comment from the public on the merits of Toyota's application for a temporary exemption from the electrical safety requirements in paragraph S5.3 of FMVSS No. 305. We are providing a 30-day comment period. After considering public comments and other available information, we will publish a notice of final action on the application in the **Federal Register**.

Dated: May 29, 2014.

Claude H. Harris,  
Acting Associate Administrator,  
for Rulemaking.

Billing Code 4910-59-P

[FR Doc. 2014-13540 Filed 06/10/2014 at 8:45 am; Publication Date: 06/11/2014]